

## User manual for cartographic symbols in ArcGIS

The symbol catalogue is based on the FGDC Standard for “Digital Cartographic Standard for Geologic Map Symbolization” ([http://ngmdb.usgs.gov/fgdc\\_gds/geolsymstd/download.php](http://ngmdb.usgs.gov/fgdc_gds/geolsymstd/download.php)). We implemented the section 25-Planetary Geology Features, and single symbols of section 12 – Fluvial and Alluvial Features, 18 – Volcanic Features and 33 – Suggested Ranges of Map Unit Color for stratigraphic Ages of Sedimentary and metamorphic rocks (see the attached Standard sections). Furthermore, four additional symbol types of every geometry feature for (1) “uncertain” spatial objects, which can not be referred to any predefined type, and (2) “vacant” objects, that the mapper can use and modify according to own needs. For representing thematic data we provide symbol classes for (3) qualitative data, which can be varied in color or shape, and for (4) quantitative data, which can be varied in size or brightness/saturation. For all the symbols see the figure 1 below.

For questions, comments or criticism and if you need more symbols for spatial features, please contact: [andrea.nass@dlr.de](mailto:andrea.nass@dlr.de).<sup>1</sup>

25.01 (l)	25.02 (l)	25.03 (l)	25.04 (l)	25.05 (l)	25.06 (l)	25.07 (l)	25.08 (l)	25.09 (l)	25.10 (l)	25.11 (l)	25.12 (l)	25.13 (l)	25.14 (l)	25.15 (l)
25.16 (l)	25.17 (l)	25.18 (l)	25.19 (l)	25.20 (l)	25.21 (l)	25.22 (l)	25.23 (l)	25.24 (l)	25.25 (l)	25.26 (l)	25.27 (l)	25.28 (l)	25.29 (l)	25.30 (l)
25.31 (l)	25.32 (l)	25.33 (l)	25.34 (l)	25.35 (l)	25.36 (l)	25.37 (l)	25.38 (l)	25.39 (l)	25.40 (l)	25.41 (l)	25.42 (l)	25.43 (l)	25.44 (l)	25.45 (l)
25.46 (l)	25.47 (l)	25.48 (l)	25.49 (l)	25.50 (l)	25.51 (l)	25.52 (l)	25.53 (a)	25.54 (a)	25.55 (l)	25.56 (l)	25.57 (l)	25.58 (l)	25.59 (l)	25.60 (l)
25.61 (l)	25.62 (l)	25.63 (l)	25.64 (l)	25.65 (l)	25.66 (l)	25.67 (l)	25.68 (l)	25.69 (p)	25.70 (p)	25.71 (l)	25.72 (l)	25.73 (l)	25.74 (l)	25.75 (a)
25.76 (p)	25.77 (p)	25.78 (p)	25.79 (p)	25.80 (a)	25.81 (a)	25.82 (p)	25.83 (ap)	25.84 (a)	25.85 (p)	25.86	25.87 (p)	25.88 (p)	25.89 (p)	25.90 (ap)
25.91 (a)	25.92 (a)	25.93 (a)	25.94 (a)	25.95 (a)	25.96 (a)	25.97 (a)	25.98 (a)	25.99 (a)	25.100 (l)	25.101 (p)	25.102 (p)	25.103 (a)	25.104 (p)	25.105 (a)
25.106 (p)	25.107 (p)	25.108 (ap)	25.109 (a)	25.110 (a)	25.111 (a)	25.112 (a)	25.113 (a)	25.114 (l)	25.115 (a)	25.116 (a)	25.117 (ap)	25.118 (a)	25.119 (a)	25.120 (a)
25.121 (a)	25.122 (a)	25.123 (a)	25.124 (a)	25.125 (a)	25.126 (ap)	25.127	25.128	25.129	25.130 (a)	25.131 (a)	25.132	25.133	25.134 (a)	25.135 (a)
12.05 (p)	12.06 (p)	12.07 (p)	12.08 (p)		18.41 (l)	18.42 (l)	18.43 (l)	18.44 (l)	18.45 (l)					
	33.030 (a)	33.050 (a)	33.070 (a)	33.0X0 (a)	33.057 (a)	33.07X (a)	33.036 (a)	33.047 (a)	33.05X (a)					
33.A60 (a)	33.270 (a)	33.3X0 (a)	33.150 (a)	33.370 (a)	33.5X0 (a)	33.033 (a)	33.055 (a)	33.077 (a)	33.0XX (a)					
90.01 (p)	90.02 (l)	90.03 (a)		91.01 (p)	91.02 (l)	91.03 (a)		92.01 (p)	92.02 (l)	92.03 (a)		93.01 (p)	93.02 (l)	93.03 (a)

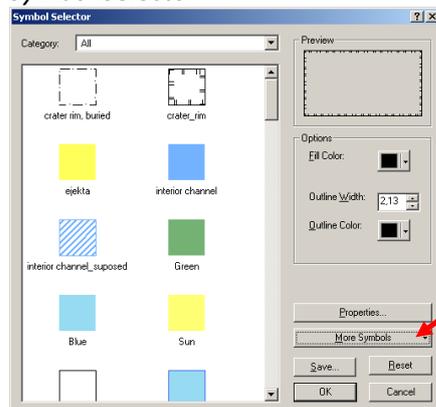
Fig. 1 This figure below displays the entirety of the implemented symbols in ArcGIS with the corresponding reference number for the FGDC standard section. (p) indicates a point symbol, (l) indicates an linear symbol, (a) indicates an area symbol.

<sup>1</sup> For more information see also **A. Nass, S. van Gasselt, R. Jaumann and H. Asche (in press)**. Implementation of cartographic symbols for planetary mapping in geographic information systems, *Planetary and Space Science, Special Issue: Planetary Mapping*, [doi:10.1016/j.pss.2010.08.022](https://doi.org/10.1016/j.pss.2010.08.022)

## Getting Started

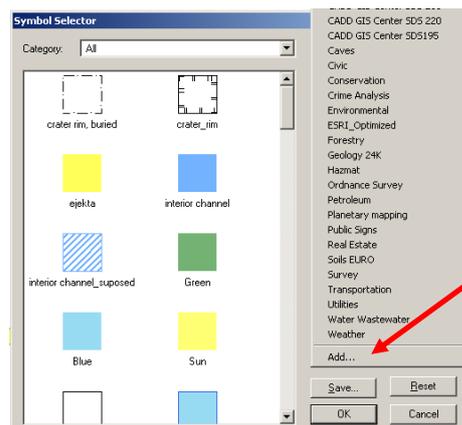
1. Download and decompress folder *Planetary Geology Symbols\_08.zip*.
2. Cut file *Planetary Geology Features\_08.style* and save on *C:\Programme\ArcGIS\Styles*.
3. Cut folder *Pictures Planetary Geology Features\_08* and *Pattern Planetary Geology Features\_08* and save on *C:\Programme\ArcGIS\Styles\Pictures*.
4. The folder *FGDC sections* contain the relevant FGDC captions that were implemented (which symbols in detail you can see in the comment column).
5. Open ArcMap and start mapping.....
6. For modifying the cartographic visualization of the particular *shape* or *Feature Class* entry, you have to follow the steps listed below (which starts with a double click on the symbol layer to be processed).

### 7. Symbol Selector



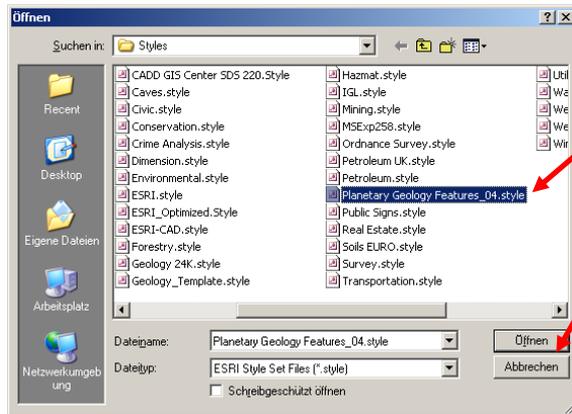
Click More Symbols....

8.



Click Add....

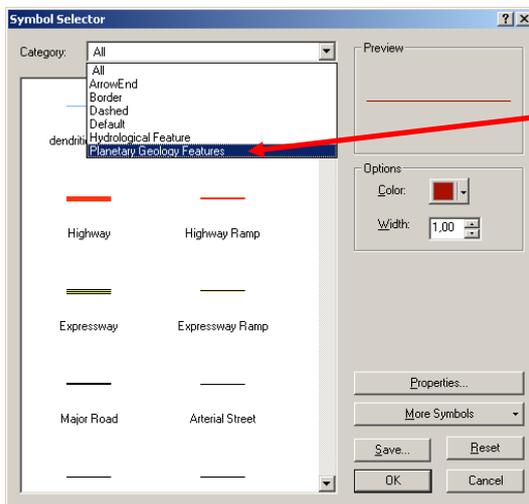
9.



Select file *Planetary Geology Features\_08.style* and click *open*.

10. Click again *More Symbols* and activates style *Planetary Geology Features\_08.style* (if this is not automatically activates).

11.



Select *Planetary Geology Features* in the *Category* box and the implemented symbols appear (dependent on data type point, line or polygon).

12. Now you can choose the symbol by the detailed symbol description or/and by the help of the \*.pdf in *FDGC section* folder. For the usage of the FGDC standard we include the reference number in the symbol description.

### Special marks

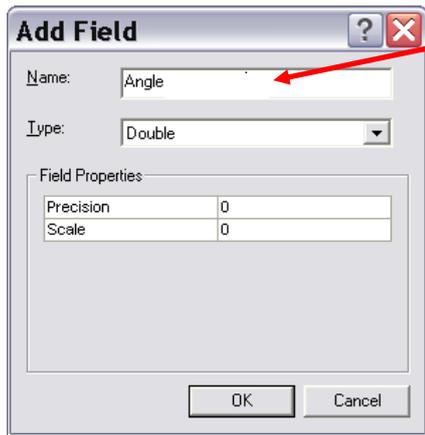
13. Some symbols are building in combination of two symbols, e.g. a polygon feature needs beside the polygon symbol a point symbol (e.g. 25.83 Knob, planetary). Therefore you have to add a single point shape and assign this with the symbol 25.83 (see in fig. 1).

14. Some of the point symbols need a direction/orientation, e.g. 25.69 Area of channelized erosion and scouring. This assignment can be done before or after the mapping.

14.1. Activate the *shape* or *Feature Class* in the TOC (Table of Content).

14.2. Right click on layer and *Open Attribute Table*.

14.3. *Options/ Add field*

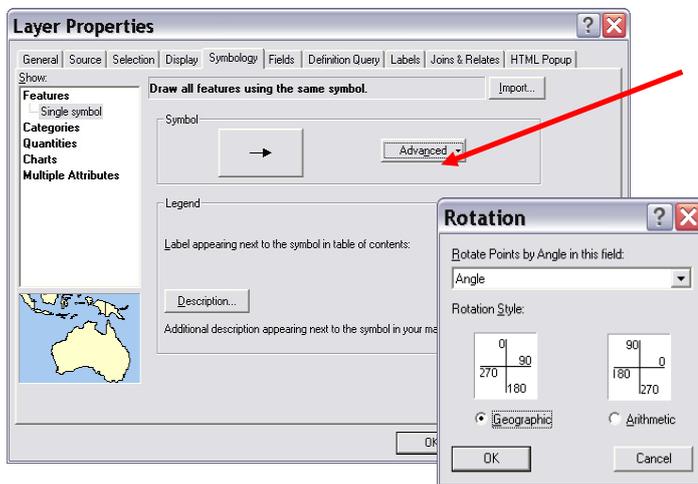


Name "Angle" and type "Double".

14.4. Choose your symbol.

14.5. Right click on *Layer Properties/ Symbology*.

14.6.

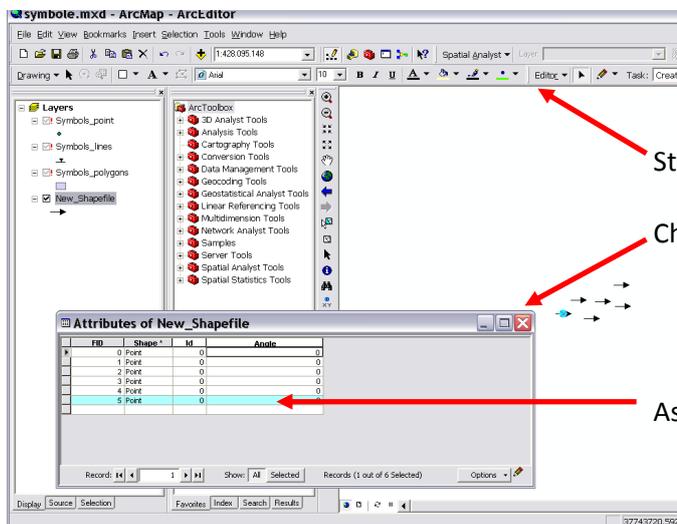


Open *Advanced/ Rotation* and choose the defined column *Angle* in *Rotation Point by angle...*

And decide for a rotation style (*Geographic* or *Arithmetic*).

14.7. Open *Attribut Tabelle* once again (the *Edit Session* must be active!!)

14.8. Sign in the column "Angle" the rotation angle (depending on rotations style) for every particular symbol.

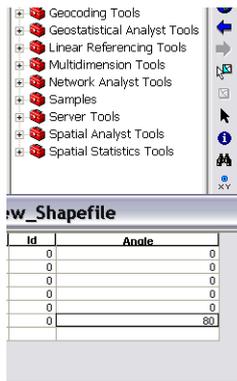


Start *Edit Session*

Choose the particular point feature

Assign the rotation angle.

14.9.



... and you can see the rotated symbol (here *Rotation type: Geographic and Angle: 80*)

